CQ-TV MAGAZINE No. 123

BRITISH AMATEUR TELEVISION CLUB

AUGUST 1983

also....

A PAL COLOUR CODER
BATC SHOW ROUNDUP
6W 70cm LINEAR AMPLIFIER
NBTV WHAT IS IT?
VHF-UHF MANUAL REVIEWED
etc etc....

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FULL YEAR: £4 or £1 for each remaining quarter of the year.
All subscriptions fall due on the first of January each year. Overseas members are asked not to send foreign cheques please.

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CLOSE FOR PRESS DATE FOR THE NOVEMBER ISSUE.....20th September 1983

EDITORS POSTBAG

Dear Ed

I discovered this month the existence of "Ham Radio Today" magazine and was really surprised at its content.

Being a member of the local ATV group (ON6PM/T) my interest went of course to Trevor Browns article on a simple ATV station.

I should like to know how to become a member of the BATC. There does not seem to be such a club here on the Continent and the BATC seems to be the only one available.

We of the ATV group operate every Saturday between 15.00 and 17.00 GMT. The call is ON6PM/T and we transmit an ATV newspaper (news and reports from around the club), report of reception from our viewers and a technical hour (with lectures) either live or from video tapes.

We only transmit in the 70cm band as we, in Belgium, are not yet permitted to use the higher frequency bands.

Jose Robat ON7TP

Dear Ed,

I receive the RSGB Microwave Newsletter each month. In the April issue there was a note that the Microwave Committee were making submissions to the IARU concerning band planning on 2.3GHz. Perhaps now is the time for BATC to think about a TV band plan for 2.3. I should like to suggest the CCIR UHF TV channels as a starting point.

The CCIR has divided the UHF frequencies from 302MHz to 2998MHz into 8MHz channels. The lower frequency limit L of each channel is found from the equation;

$$L(MHz) = 302 + 8N$$

where the channel number N is in the range from 0 to 336. The vision and sound carrier frequencies V and S for CCIR system I are given by equations;

$$V(MHz) = 302 + 8N + 1.25$$

and $$S(MHz) = 302 + 8N + 7.25$$

There are 17 channels in the 2.3GHz band, numbered from 251 to 267.

In CQ-TV 118 on page 17 Peter Blakeborough proposes a specification for Medium Deviation FM-TV with a channel spacing of 15MHz. If the channel spacing for MD FM-TV in the 2.3GHz band were made 16MHz, then alternate channel numbers of the AM TV spacing could be used.

The 8MHz channels are really for Vestigial Sideband AM-TV, so as Double Sideband AM-TV needs more than 8MHz bandwidth and is more likely to be tried first, then starting off with just the odd numbered channels for both DSB AM-TV and MD FM-TV seems prudent.

The vision carrier frequencies of the 9 odd numbered channels are:-

Channel number	Vision Carrier (MHz)
251	2311.25
253	2327.25
255	2343.25
257	2359.25
259	2375.25
261	2391.25
263	2407.25
265	2423.25
267	2439.25

Andrew Sturt G8SIK

Dear Ed,

I was pleased to see that CQ-TV is moving into the computer age with the publication in No.122 of the

Test Card program ("Circuit Notebook"). Unfortunately, however, this program perpetrates one of the classic "howlers" of TV-related graphics programs. It makes the mistake of assuming that the BBC Micro's graphics units are square. In fact, when displayed on a properly adjusted monitor, they are rectangles whose height/width ratio is approximately 1.048 so the circles on your Test Card are not circular! The following changes to the programe will rectify matters:

In line 170 change 400 to 369
In line 350 change 300 to 277

I hope that not too many BBC Micro-owning members have been adjusting their picture monitors (unless, of course, they have one of my Test Card generators - as per Handbook 1 - which does have a circular circle!).

Richard Russell G4BAU.

Dear Ed,

I would like to try and arrange skeds for ATV contacts. I have a 48 element on top of a block of high-rise flats at 200' overlooking Swansea Bay.
The equipment comprises an IC240 and a Microwave Modules transverter. A Wood and Douglas modulator controls a 10 Watt transmitter which in turn drives a 50 Watt linear. On receive I have both Fortop and Practical Wireless converters.
Anyone wishing to arrange a sked is invited to contact me at: 42 Hazel Court, Sketty, Swansea SA2 8HJ, West Glamorgan. S. Wales.

John Davies GW4IOI.

Dear Ed,

I was most interested to see your FM receiver article in CQ-TV 122, which I will try as soon as I receive the PCB. I've built seven circuits so far, starting with the NE561, the last four with the NE564, and I had just about reached the stage of the previous demodulator design, using a BFY90 to drive the PLL.
A couple of things that you may be interested in is that to keep thermal drift down, I damp pin 1 of the NE564 with a 47-ohm resistor. This drops the supply down to about 10 volts and the device will happily work all day at 34°C. On pin 10 I feed 12 volts through a 1k pot into an 82-ohm resistor, then to pin 10. I found that different chips require different loads to optimise the VCO. The 82-ohm just stops you going over 8 volts, which it doesn't seem to like, (they squeak audibly!!)
Still on the subject of FM-TV receivers; the MC1357 (RCA eq't CA2111) certainly looks promising. Have any other amateurs experimented with this IC?
My reference here is the Moscow 1st programme on 714MHz, but I hope soon to be operating on 24cm FM, if the PMG will allow it. At present a bandwidth of 6MHz is all that is allowed. 70cm is barred to ATV, except for two amateurs who were licenced previously, but to whom they can transmit remains to be seen.
For a future article, I wondered if you would consider a few lines on the TDA3590. It converts SECAM to PAL, something your South Coast readers may also be interested in.
Thanks for your articles in CQ-TV, they certainly make interesting reading.

Jim Maden
South Africa.

(Editors note)

I am allways interested in any article for the magazine. The device to which you refer sounds fine. Please send along anything you have Jim.

Dear Ed,

Although I have been operational on ATV for a couple of years, pressure of work has tended to keep me off the air, however, I am operational on both monochrome and colour, with approximately 100 Watts of RF using a modified FORTOP transmitter and a modified Microwave Modules 100W PA. The aerials in use are an 88 element Multibeam and an 8/8 slot at about 70ft. As we all know, getting a good picture depends on getting maximum gain from the aerial and minimum losses in the feeders. I had been rather disappointed with the pictures that I was receiving, therefore I have set about looking at the aerial system.

I replaced the UR67 feeder with the new H100 (Pope) cable, fitted a mast-head GaAs FET pre-amplifier and relocated my 8/8 and 88el Multibeam on a glass fibre crossboom which is attached to the tower via an elevation rotator, the aerial now being at about 80ft. I have noticed an incredible improvement in receive performance and, without doubt, the 88 el performs far better when attached to a glass fibre tube, than having the aluminium or steel stub mast running through the centre. It is difficult to provide direct comparisons between the system now and the system before, but without the pre-amplifier in circuit I reckon that the change of feeder and the relocation of the Multibeam has given me an improvement of at least 10dB. Most of this I believe to be due to the relocation. The pre-amplifier also seems very worthwhile, especially on ATV.

By mounting these aerials on an elevation rotator, I have found that from my location, the strongest signal is often received when the aerials are at about 5°. Another interesting point is that I have a 14el Parabeam for 2 metres mounted about 4 ft below the 70cm aerials. I find the minimum VSWR occurs on both 70 and 2 when the 70cm aerials are swung over by 180°, ie; when the 2m aerials are pointing North and the 70cm aerials are pointing South. I think that all of these factors indicate that a lot of care and attention should be given to the aerial system, especially for ATV.

Steve Haseldine G8EBM

Dear Ed,

I wonder if any member can help me with a problem on 70cm RF PA modules.

My friend and I are both of the old "valve" school but are swinging over to solid-state. We both obtained Motorola MHW710-2 modules (albeit the cheap ones) and fitted good heat sinks with carefull de-coupling. They were never driven by anything stronger than a Pye Pocketphone at 80mW and were coaxed up to about 4 Watts output. Then, for some obscure reason, they died. There was no spectacular surge or overheating.

I had another go and obtained a TRW 7108 module of 5 Watts output for 80mW in. After a short spell of around 2 Watts output the same thing happened.

This sort of thing tends to make one go back to "bottle" PA's. Have any of your readers experienced this trouble or can tell us where we went wrong.

R.Hall G8PDJ and E O'Brien G80MZ.

(Editors note.)

I don't usually answer technical questions but I do feel that the fault lies with your Pocketphone driver. These are a bit notorious unless you are used to them. In all probability the matching between the driver and PA was incorrect and some spurious signals got into the PA. Since these would probably have been at quite a high level, they could have overloaded the devices.

NEWS ROUNDUP

PRE-AMPLIFIERS

I see muTek are advertising their Noise Matched NE64535 1.3GHz low-noise amplifier (BLNA 1296ub) again. Welcome back. This is a first class unit which has adequate bandwidth to cover the whole of the 1.3GHz band.
Gain is quoted as 12dB and noise figure around 1.8dB. (I have put mine through the lab and find that it easily reached the quoted performance figures. ED).
The unit is supplied unboxed, on a small printed circuit board with BNC connectors fitted.
It should be super for mast-head or shack-end ATV use. Price - £24.50 plus £1.20p postage!!
muTek Ltd., Bradworthy, Holsworthy, Devon EX22 7TU.

SPACE HAM

You've probably heard that Dr.Owen Garriott W5LFL, is to take with him a 2 metre transceiver when he takes to the skies in the STS-9 Space Shuttle, due to be launched in September.
Is this "one giant step for amateur radio"?
Now, they do have plenty of TV cameras fitted into the spacecraft so all that is needed is a 70cm or 24cm transmitter. Transmitter plus TV camera equals.....!

VIDICON TUBES

It has become necessary to reduce the size of Members Services order form. The form does not now include Vidicon camera tubes. However Peter Delaney advises that these are still available to order at £20 each. Please phone Wargrave 3121 for further details. supplies of 2/3" tubes are still very limited.

VIDEO FILTER

An error has crept into the circuit diagram of the low-pass video filter in both CQ-TV 122 and "TV For Amateurs".
R8 is shown as 390-ohms but should read 1.2k

CQ-TV COPY

My thanks to those who send in items for inclusion in CQ-TV. Please keep them coming.
It is my policy to try and use everything which I am sent (within reason), but sometimes items have to be held over for a while. If you have sent an item which does not quickly appear in print, do not despair, it probably will in due course.
I am sorry that I can't acknowledge receipt of material. This would entail too much time and expense.

ED.

ELECTRONICS HOBBIES FAIR

This years Hobbies Fair will be held between the 27th and 30th of October at the Alexandra Pavilion in London.
The BATC is to exhibit at the fair and would like to hear from anyone who could come along to lend a hand on the stand. Even a couple of hours would be helpful. Please contact Peter Delaney (Members Services Dept.) as soon as possible.

70cm ATV TRANSMITTER

Some people seem to be having difficulty in obtaining 4.5mm coil formers for the oscillator coil L1. A good source is the small television IF transformers found in many of the older transistor set chassis. Alternatives (5mm dia) are available from Amateur Radio Bulk Buying Group, Maplin Electronics or Ambit.

FM-TV RECEIVER

As stated in the suppliers list at the end of the FM-TV receiver article in the last issue, Ambit International are able to supply all the components for this project. The NE592 does not appear in their latest catalogue since the BATC has only recently arranged for the IC's to be stocked. The price is £1.36p each plus postage plus VAT.
The NE564 PLL IC is rather prone to heating. Over a period of time this may cause the internal oscillator to drift. Fitting a heatsink on top of the IC package will help considerably. Another solution may be found under 'Editors Postbag' in a letter from Jim Maden.
It seems that the number given for L1 had a digit missing. It should read: TKXCA343732CN. Well fancy using such unmanageable numbers!
The input impedance of the demodulator, you will notice, is rather high. With all the tuners so far tried this has had no detrimental effect. However, in the interests of correct matching (which could effect the bandwidth) it may be necessary to connect a low value resistor (about 75 or 100-ohms) from the input socket to ground. This must be done when using the U321 tuner, (see Fig.4 page 11. CQ-TV122).

10GHz TV - HANDBOOK 2

Peter Delaney advises that he has negatives for the 10GHz circuits contained in Handbook 2. If any member is interested in this project, they are invited to send a SAE to Peter (Members Services) for further details.

MEMBERS SERVICES

Members are asked NOT to send banknotes through the post. Peter Delaney reports that sometimes £20 or £30 are received in that way. Sooner or later one of these orders is going to get lost in the post. Please also note that foreign currency cannot be accepted.
When ordering from members services (or publications) would you please use the latest order form. Some items are still being ordered which are either discontinued or have changed price.

JUNE 18th LIFT

The weekend of 18th and 19th of June saw a good lift in band conditions.
The opening seemed to favour the West this time and good pictures were seen from Holland and Germany.
The photo's show some of the stations seen by the Editor in the Midlands and serve to illustrate the strength of continental signals.
The Editor worked several stations including a 2-way with DL1YAQ who was using just 6 Watts!

PAL CODER

by John Goode

Probably the majority of ATV shacks these days support some method of generating colour pictures. With the recent upsurge in electronic picture generation and the use of microcomputers, there is an ever-increasing need to provide a separate PAL coder in order to provide the necessary composite signals from station RGB sources.

Perhaps the most widely used design at present is the one published in the BATC "Amateur Television Handbook" Vol.1. This excellent design works well and is easy to build and set-up. However, as with many simple designs, there are limitations. The main drawback with the Handbook Coder is the fact that the carrier-balance setting drifts with temperature; also, the degree of carrier suppression that can be obtained is only moderate (adequate for amateur use though). These problems arise from using domestic TV ICs; however this must be balanced against the simplicity of the associated circuitry resulting from only a single voltage rail, and two modulators and PAL switch all within a single IC!

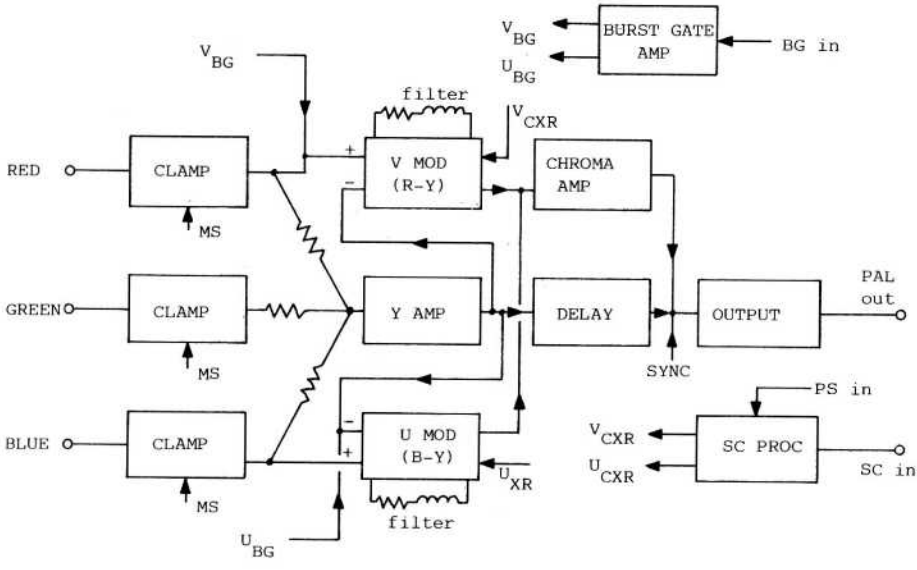


Fig.1 PAL COLOUR CODER BLOCK DIAGRAM

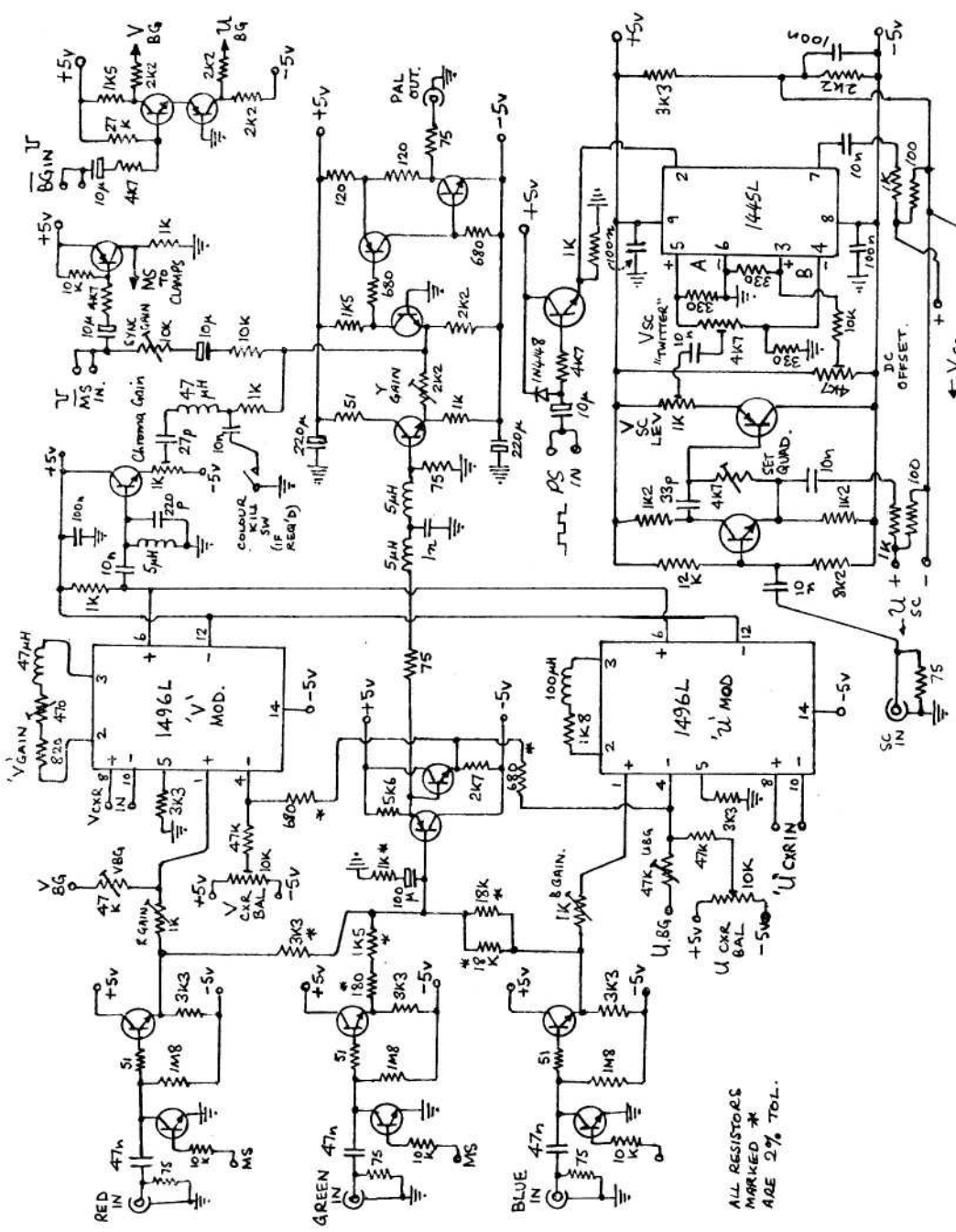


Fig.2 PAL CODER CIRCUIT DIAGRAM

I have built two of these coders, and have found it advantageous to use 20-turn potentiometers for the carrier-balance controls, mounting them on the equipment front-panel with flying leads to the PCB. Most of the drift occurs in the first 15 minutes after switch-on, after which the setting remains reasonably stable. Both coders have colour bar generators built in (Nigel Walker's design from the 1976 Handbook), so that alignment can be checked at the flick of a switch, and adjusted from the front panel whenever necessary.

A more expensive design, that will hopefully give greater stability, may be realised by adopting the following features:-

1) Positive and Negative supply rails, arranged to track thermal variations.
2) The use of MC1496 modulator ICs.

The circuit which I have devised will, I believe, form the basis of a good quality coder, although it must be stressed that the unit has not yet been built and tested. The design includes the use of differential inputs of the modulators as part of the colour difference matrices and uses the adjust gain terminals on the 1496s (pins 2 & 3) as a bandwidth filter by including an inductor in series with the gain resistor.

Fig.1 shows the complete block diagram of the PAL coder from which the circuit operation may be understood in more detail.

Drive requirements for the unit are: RGB signals and subcarrier (both at standard level into 75-Ohms), mixed syncs, burst gate, and PAL switch.

A single printed circuit board would be ideal for the coder although it is recommended that a prototype be built first before embarking on a full PCB layout. All resistors marked '*' are 2% tolerance. The 5µH chokes in this (and other) designs are in fact RS Components 1A VHF chokes, which cost about a third of the price of "proper" inductors. (I think they are also available from Maplin Electronics).

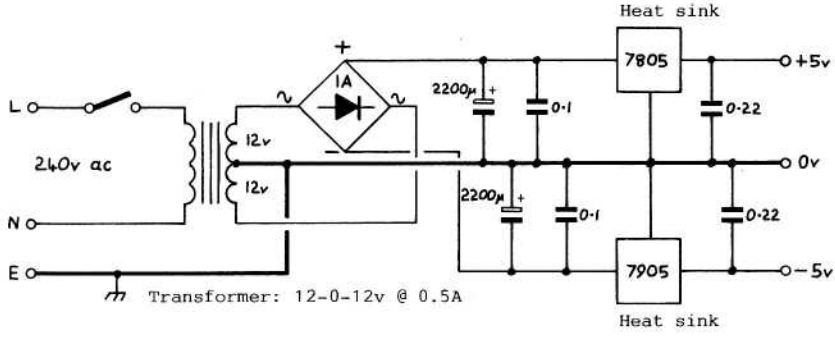


Fig.3 PAL CODER POWER SUPPLY

Fig.3 shows the circuit of a suitable power supply for this coder. The supply should use 7805 and 7905 regulators mounted on a common heatsink, this is to ensure good thermal tracking.

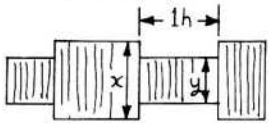
SETTING UP

1. Disconnect the subcarrier input or operate the colour killer switch.

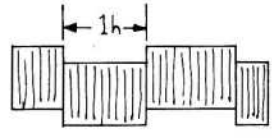
2. Set the sync level to 0.3v into 75-Ohms.

3. Apply colour bars. Check for luma staircase and adjust 'Y' gain for 0.7v into 75-Ohms.

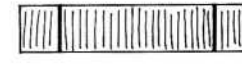
4. Connect subcarrier to coder. Adjust "set quad" to give 90° phase-shift between "U" output and "V" SC level pot. Monitor 1445L output (pin 7) and adjust for minimum "twitter" and minimum DC offset. See diagrams below.



Minimum "twitter" when x = y



DC offset wrong



DC offset correct. "twitter" correct.

Adjust "V" SC level pot so that U & V SC outputs are equal in level.

5. Connect subcarrier and adjust carrier balance controls for minimum subcarrier on black bar and blanking period.

6. Adjust 'R' gain and 'B' gain for minimum subcarrier on white bar.

7. Adjust 'V' gain for correct bars chroma envelope - (best with a vectorscope).

8. Adjust chroma gain control.

9. Adjust 'U' and 'V' burst gate controls for correct burst phase and amplitude.

10. Re-trim the above sequence.

The Editor would be pleased to hear from anyone building this coder and would be interested in any observations on the design and construction techniques used.

LINCOLN HAMFEST

Brian Summers, G8GQS, took along his outside broadcast van to the recent Lincoln Hamfest. As usual the unit attracted much interest and, with all the hardware scattered about, added a certain "professionalism" to the proceedings.

Three cameras were out on display from the van and at one point four different pictures were being simultaneously monitored on the main stand. Those involved with the ATV display included; G6NCR, G6HMS, G8CJS, G8XUU, G8GQS, Berard Golland and Alan Watson.

A roving camera was employed around the showground which televised the various activities and transmitted them back to the OB unit. The resulting pictures were displayed in the main hall. In charge of the roving eye was G6HMS.

Trevor Brown (BATC Secretary) was also there demonstrating the various projects etc. from the two BATC handbooks. His excellent equipment attracted much interest and, as usual, Trevor got quite hoarse answering everyones questions. Handbooks were also on sale which apparently went very well.

Acknowledgement to Brian Summers G8GQS for this report and the photo's.

NBTV....what is it?

by Doug Pitt.

British books on T.V. theory have usually had a first chapter which mentioned the Nipkow Disc (100 years old next January!) and maybe the BBC/Baird 30 line transmissions of 1930-35. These "pioneer" activities, described with a sort of amused tolerance, would then be dismissed as a "blank end" in the preparation for the "real" (ie. electronic) T.V. of Chapter 2 onwards. This introduction vanished from U.S. publications ages ago partly because of the negligible impact of the mechanical T.V. period there, but mainly because of the very late development of T.V. in North America, due to politico-legal factors.

If we hear an "educated" transatlantic T.V. engineer express the innocent belief that television was "invented" in the U.S.A. around 1941 by someone in R.C.A's laboratories, we resist the urge to roll about on the floor in hysterics like a Red Indian hearing that Columbus discovered America. Instead, we smile knowingly. There is no justification for this complacency. Although history has been less vigorously rewritten here, there are plenty of gross misconceptions in the U.K. about pre-war television, both mechanical and low-definition. These two aspects, though linked in historical context, are two separate subjects and will be dealt with as such in the text which follows, listing some widely held ideas.

LOW DEFINITION.

1. "The BBC/Baird 30 line transmissions of 1930-35 had no entertainment value".
I have extracted from the Radio Times of the last 21 months of L.D. broadcasts, (Jan 34 - Sept 35) a few names that will ring a bell with the sufficiently long-toothed. Margaret Bannerman, Jack Buchanan, Jeanne de Casalis, Peggy Cochrane, Anton Dolin, Gracie Feilds, Ronald Frankau, Hermione Gingold, Harry Hemsley, Leonard Henry, Lupino Lane, Alicia Markova, Billy Milton, Donald Peers, Lydia Sokolova, Anono Wynn. These names were all "top of the bill" at the time. Would artistes of this calibre have performed willingly, or repeatedly, for a medium of no entertainment value? Of course, the subject matter had to fit the amount of detail available, but this is true of 8mm home movies, etc.

2. "Low numbers of lines give low picture resolution".
Early T.V. enthusiasts mostly used mechanical gear, so the size and shape of the scanning "point" could be widely varied. Using photographic techniques, the range was unlimited. So everybody knew that resolution was determined by two factors: aperture shape and line number. The modern constructor is lumbered with an inflexible "spot", a roughly round blob of glowing phosphor, with a diffused edge, so only the second factor survives in his mind (assuming he was ever aware of the first!).

This has led to some weird concepts, including that of the "pixel" or "picture element" in discussing a situation where (assuming continuous-motion scanning)

the "element" is a digital quantity in one direction and an analogue quantity at right-angles!!! Because writers of T.V. theory books have never seen a mechanically produced picture, they can safely dismiss it as "inferior" together with the mathematics surrounding it and the formula:

$$f_{(max.\ ua)} = \frac{pal^2}{\pi s} \text{ becomes } f_{(Max)} = \frac{pal^2}{2} .$$

assuming a square "spot", (shape factor, s, = unity) the error becomes approximately one third and an examination of a correctly adjusted monochrome receiver (any line number) will confirm that about a third of the picture has been lost down the cracks between the lines.

MECHANICAL

3. "Mechanical T.V. is bulky".
Anyone who has studied the exhibits on the NBTV stand at any BATC convention will confirm that they seem to demand a great deal of elbow room. However these are the products of amateur constructors, often using kitchen table engineering and a shoestring budget, a skilled precision engineer with a thick wallet could do much better. Some years ago, a mechanical T.V.camera of 5mm diameter, for insertion into a human vein was produced, (by, I think, Philips of Eindhoven). The advantages of a low-voltage device in this situation can be appreciated.

4. "Mechanical T.V. gives only a very small picture".
I have in front of me an advert from T.V.Monthly dated December 1932. This solemnly assures the amateur constructor: "The MSV 203 (crater lamp) will carry 15 Watts and give a picture six feet high". Not bad, unless you're very short sighted!!

5. "Mechanical T.V. cannot be used for large numbers of picture lines".
Well, how many is "large"? Lets list the facts. The Nipkow disc and Mirror drum were very good up to about 50 lines or so. The Mirror screw and Stationary (Mihaly) mirror drum were O.K. up to around 180 lines. A rapidly rotating Mirror polygon combined with an oscillating mirror gave excellent 405 line pictures in the late thirties. A modern version of this by Dwight Cavendish Ltd., of Huntingdon, currently offers a choice of 625 lines for standard T.V. on a giant screen or 1250 lines (faster rotation) for super high quality T.V. The novel feature of this colour T.V. system is its use of laser instead of incoherent light.

6. "Mechanical T.V. has inferior linearity".
Without defining the last term too rigidly, let's list the known aberrations of form in CRT reception: a. aspect ratio error, b. line sawtooth curvature, c. frame sawtooth curvature and d. line tearing. Now compare a mechanical receiver: a. NIL, b. NIL, c. NIL, d. NIL and e. castellation error (straight lines perpendicular to scan appear ragged instead of smooth, like - if greatly exaggerated - the battlements of a castle). Judge for yourself.

7. "Mechanical T.V. is difficult to synchronise".
This is the hoariest of the legends and the hardest to shake. In reality, a reasonable statement would be, "All mechanical T.V. systems are inherently easy to syncronise" - if you accept very slight "hunting" as a

trivial defect. This error of thinking arises from the experience of the old cogwheel sync system, invented by Baird, which displaced all others during the thirties. Whilst almost immune to missing sync pulses, it could not cope with false pulses, e.g. transverse black lines in the video area. People blamed the sync device but the fault lay elsewhere. The pulses transmitted were video-black not blacker than black, but even if the proper pulses had not been available, the existing separation techniques might not have coped very well.

Given modern ultra-black pulses and a modern sync seperator circuit, the cogwheel device functions faultlessly, confirming its place as the most important advance in the development of television since the creation of optical scanning by Nipkow in 1884. It is interesting to note that reporters at the Radiolympia exhibitions up to the outbreak of World War 2 gave the mechanical "Scophony" receivers full marks for faultless sync. but complained loudly of the dreadfull line-tearing and 'rolling' of all the electronic receivers. Matters did not improve until the advent of "flywheel sync", an ingenious electronic imitation of the mechanical system, now universally employed.

Oddly enough, the real advantages of CRT reproduction are rarely mentioned. They include: High picture area to weight ratio for a given line density; ease of commercial replication; ease of switching between different scanning standards (a virtue rarely employed in practice).

I hope that these notes will have helpedto dissipate some of the fog of misunderstanding surrounding low-definition and mechanical T.V.

PUZZLE

If number of lines = resolution, then resolution = number of lines.
Study the two photographs below. They show left, a self-portrait of the late A.O.Hopkins. (mechanical, rhombic), ( ) lines. And right, a self-portrait of Ruud Christoffer, PA0RJM. (electronic, circular), ( ) lines.
Can you fill in the missing numbers?.....answer on page 42

The things you write!

A REPORT FROM THE BATC CRYPTOGRAPHIC DEPARTMENT

You may be wondering why such a department exists in the club. It does also reside under the title "Membership Records".

If you saw the examples of handwriting that we receive, you would wonder no more. Not that we are too worried that your change of address notification is written in hieroglyphics, after all we do have your money!

Why do only some of you notify us of an address change? It is astonishing just how many magazines, destined for paid-up members, are returned marked "gone away" or "not known here". Please help us to help you, when writing to ANY committee member, would you please print CLEARLY IN CAPITALS your name and address (including postcode), your OLD ADDRESS, if it has changed, your callsign, this helps to trace you when you move in secret, and of course we can look you up in the callbook if your handwriting is illegible.

As reported in an earlier CQ-TV, the membership records are kept on an Apple Computer. I hope all the information is correct, it took several months to enter the data, and the odd mistake could have crept in. Please check your address label on CQ-TV envelopes and notify us of any corrections which are needed.

In past years we have sent out subscription renewal reminders in the November magazine to everyone, whether or not their subscription was due. This was because the old, manual, system of recording made it impractical to do otherwise. Now, with the help of modern technology, only those subscribers who have not renewed on time will receive a reminder.

If you are wondering when your subscription is due, you will find a number printed in the top left hand corner of the address label. This shows the last year for which a subscription has been received, eg; 83 means that your subs are due on the first of January 1984, likewise 84 means it is due on the first of January 1985. Of course, now that the computer keeps it's eye on things, if you have not paid deletion is automatic (after a suitable period of course).

ALL correspondance regarding membership should be sent to:-
Mr. D.Lawton. Grenehurst, Pinewood Road, High Wycombe, Bucks HP12 4DD.

TELETEXT TERMINAL

by John Wood G3YQC

How many of you have sat watching Teletext pages transmitted by the broadcasting networks and thought "I wish I could produce pictures like that to put out on amateur television"? Well now you can.

Most of you will be aware that the BBC microcomputer has the full Teletext character set built-in (mode 7), therefore, assuming you have a BBC machine, all you need to do is to use these characters to compile your own Teletext pictures. Computer users will know that it is not an easy matter to design a graphics picture and then code it up correctly for incorporation into a programme. At the very least it is time consuming.

A new utility programme called 'TELETEXT TERMINAL' has just been released which allows full use of the Teletext facility by permitting the user to create and edit up to 22 pages (18 when using discs) at a time and hold them all in memory as a magazine. Magazines can be saved onto tape or disc and re-loaded when needed.

All commands are directly accessed from the keyboard and the pictures may be altered or corrected as you go or modified at a later date.

Pages can be displayed in various ways and there is an additional facility which lists the character codes for those wishing to develop their graphics from the keyboard, and then copy the codes produced for incorporation into their own programmes.

Before describing the package in detail, I must make it clear that my brother (G3RDC) and myself wrote the software. It was originally conceived and written for my own use in amateur television. However, due to the amount of general interest in the utility, I decided to have it made available to others. I will therefore restrict myself to presenting facts about the programme and will not attempt to give what may be considered to be a biassed opinion of its merits.

When the programme is run the user is presented with seven command options:-

1. Display pages
2. Create page
3. Edit page
4. Save magazine
5. Load magazine
6. Delete page
7. Copy page

Whenever this main menu is displayed, typing a "*" will allow access to the operating system, thus permitting access to the many operating/filing system commands such as *DISC, *CAT and so on. *BASIC will exit the programme.

The function of each menu option is as follows:-

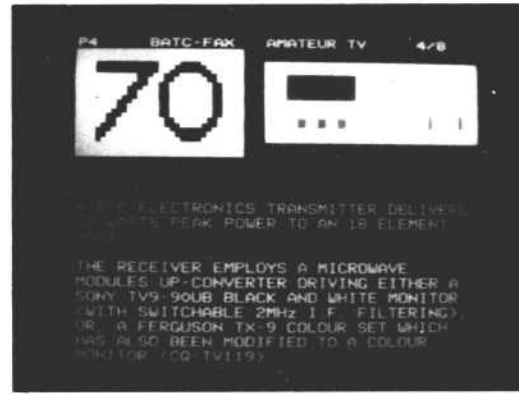
1. DISPLAY PAGES
   When this command is selected, the user is given three display options:

   1. Continuous display - displays all pages in sequence for a duration of 20 seconds per page. The programme can be altered to display pages at other durations if required.

   2. Manual display - displays pages in sequence but requires a tap on the SPACE bar to select the next page.

   3. Display character codes - permits the user to select and display a page, and to obtain a list of the character codes (in decimal) on any line. The required line is selected with the cursor and displayed using the COPY key.

2. CREATE PAGE
   Each page, when displayed, is automatically given a header line (see photo's). This line shows the current page number, a Teletext title and the number of pages currently in store. The title can be of the users own choice and may be written into the programme to provide the users' own individualised copy.
   'CREATE PAGE' permits the user to draw a Teletext page by using the keyboard. When the page is completed, the command is terminated with ESCAPE and the page is automatically stored in memory.



3. EDIT PAGE
   Permits the user to select a page in store and modify it at will. ESCAPE will exit the command and store the updated page in memory.

4. SAVE MAGAZINE
   Permits all pages in store to be written out to cassette or disc.

5. LOAD MAGAZINE
   Permits a previously saved magazine of pages to be read into memory.

6. DELETE PAGE
   Permits the user to delete any page in memory.

7. COPY PAGE
   Permits an existing page to be copied into another page location. This command can not overwrite an existing page unless the old page is first deleted.

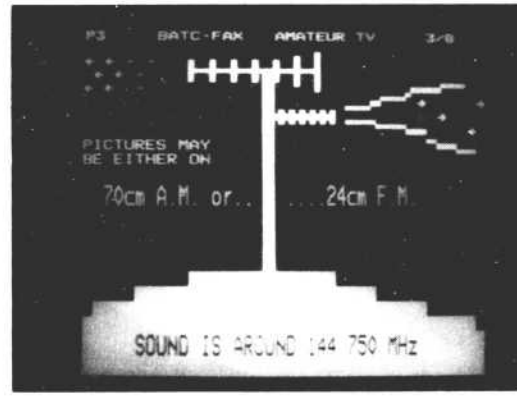
The programme comes complete with a demonstration magazine of several pages which describes how Teletext pages can be created and illustrates the use of the various command codes. The magazine includes some pictures which have been created using TELETEXT TERMINAL.

The photographs give an idea of the sort of pictures which can be produced. The possibilities are endless and are governed only by the ingenuity of the user. Apart from amateur TV and slow-scan, the programme would find uses wherever there is a need to display information such as advertising in shops etc., at exhibitions, as a teaching aid in schools, for lecturing and so on.

Mike, G8DLX has been using a prototype version for some time amd members may have seen it in use on the BATC stand at rallies and shows. Over to Mike for his comments:

"Having been involved with exhibitions and rallies on behalf of the BATC for a number of years, I am always on the look out for new display material and ideas to help on our stands. TELETEXT TERMINAL has proved very useful in that it enables a number of continualy changing pages of information to be displayed on the screen, giving an interesting and informative display which does not need constant attention.

Entering information, particularly graphics, onto the screen can be quite time consuming. However if similar background layouts are required the "copy" facility can be used to good advantage. The backround may be created once, then copied, and the new foreground entered using the edit mode. Simple changes, such as a different call sign on a test card, are particularly easy to accomplish with this utility.



This programme would be of great use to those of our members who own a BBC Micro. The effect is such that at exhibitions amateurs' often think we are receiving Ceefax or Oracle pictures direct from the broadcasting companies.

The only slight criticism I can make is that although the graphics codes are set out clearly in the documentation, the method used to enter them could be more clearly illustrated to help the beginner, perhaps sample lines could be given".

TELETEXT TERMINAL is a very sophisticated and powerful utility whose uses are only limited by the ingenuity and imagination of the user.
The package is available at present on cassette only although it will be available on disc later. The programme runs equally well on a disc system and may be transferred directly from the tape.

The package is available at present on cassette only although it will be available on disc later. The programme runs equally well on a disc system and may be transferred directly from the cassette.

Full documentation is supplied including a chart detailing the full Teletext graphics fount and giving the appropriate keys to press and their corresponding codes.

TELETEXT TERMINAL is available price £15 inc. postage from Scarab Systems, 141 Nelson Road, Gillingham, Kent ME7 4LT.

CIRCUIT NOTEBOOK

Number 37

by John Lawrence GW3JGA

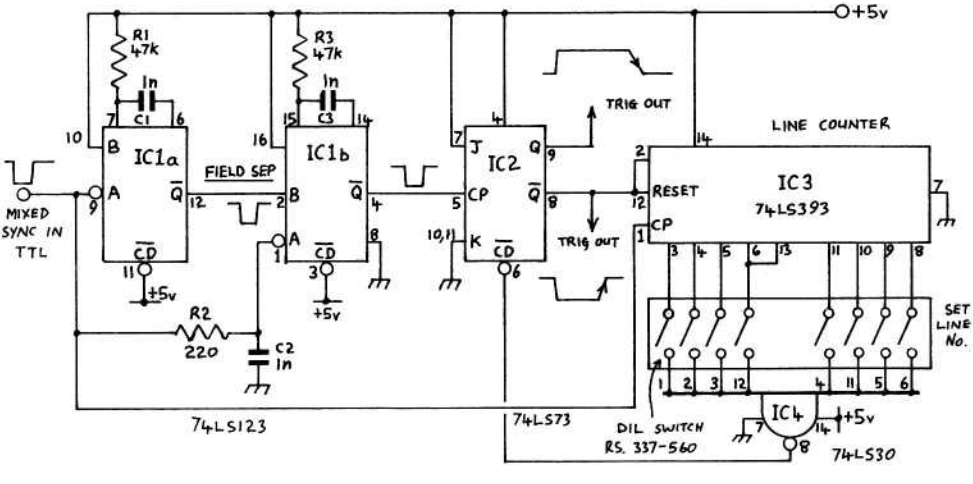
If you wish to insert, say, an electronic caption on a particular picture line or to trigger an oscilloscope to examine Vertical Interval Signals, then some form of field sync detector and time delay (monostable or preferably a line counter) is required to generate the appropriate start signal.

The circuit shown does just this. Also, by using an 8-bit binary counter and an 8-pole DIL switch, the delay or particular line number (up to 255) following the field sync, can be selected in one line increments.

The input signal is mixed syncs at TTL level, if your signal is composite video then a sync separator stage will be needed to precede this. IC1, (74LS123) comprises two monostables, both are connected for triggering on the leading negative-going sync edge. The $\overline{Q}$ output from IC1a inhibits the triggering of IC1b unless the A input of IC1b is still low after IC1a has timed out (15µS).

On field sync, (either normal broad pulses or a single broad pulse) IC1a times out while IC1b input A is still low and IC1b is therefore triggered, generating a single output pulse (15µS). R2 and C2 are included to remove the glitch which would otherwise be present due to the propogation delay through IC1a.

At field sync then, the negative-going pulse at IC1b $\overline{Q}$ clocks IC2a (1/2 74LS73) causing IC2a $\overline{Q}$ to go low, removing the reset from the line counter IC3 (74LS393). This dual 4-bit binary counter is now clocked by line pulses (mixed sync) and the counter outputs are fed via the "SET LINE No." switch to IC4 (74LS30), an 8-input NAND gate. When all inputs are high the output of IC4 goes low and clears IC2a and the $\overline{Q}$ output from this terminates the count and resets IC3. The positive-going edge at IC2a $\overline{Q}$ (or negative-going at Q) can be used to initiate captions, trigger an oscilloscope etc.



COAXIAL CONNECTORS

In the last issue we examined BNC plugs and jacks and gave illustrated assembly instructions for the more popular styles likely to be encountered by radio amateurs.

Charts detailing the various types available give the Greenpar order numbers. You should be aware that the part numbers in bold type are those items which are commonly available from stockists. The other numbers are normally available to order.

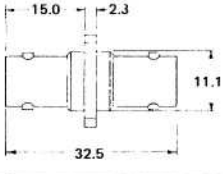
This time we continue with the BNC range and give details of bulkhead and panel sockets and the more common straight adaptors.

In the next issue we shall look at series UHF connectors as found on most amateur RF equipment and used extensively for video distribution.

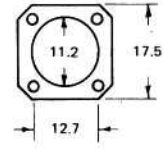
BNC miscellaneous

ADAPTORS

PANEL STRAIGHT ADAPTOR
50 ohm: GE 35081. 75 ohm: GE 37581

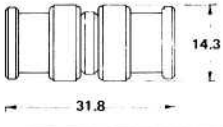


MOUNTING DETAILS

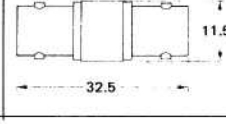


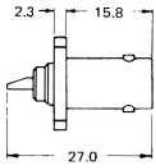
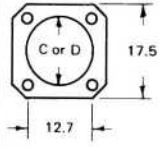
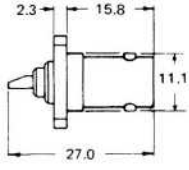
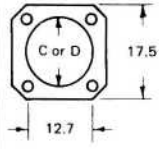
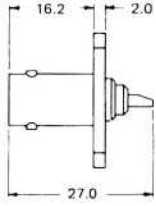
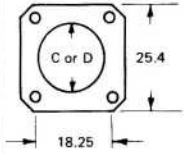
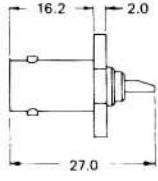
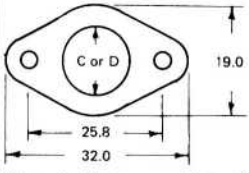
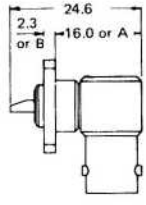
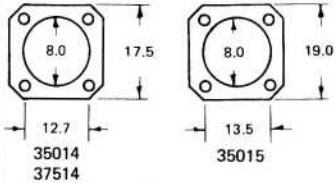
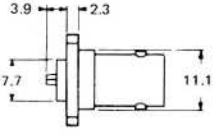
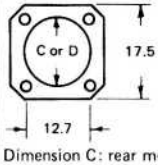
MOUNTING HOLES
3 - 36 UNF – E
4 - 40 UNC – F
6BA – G
3.0 mm. dia. – H
2.8 mm. dia. – K

STRAIGHT ADAPTOR
50 ohm: GE 35032. 75 ohm: GE 37532



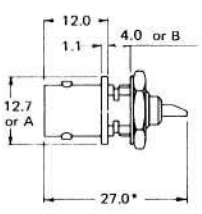
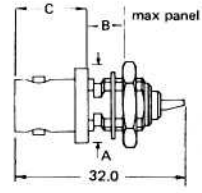
STRAIGHT ADAPTOR
50 ohm: GE **35034**. 75 ohm: GE 37534

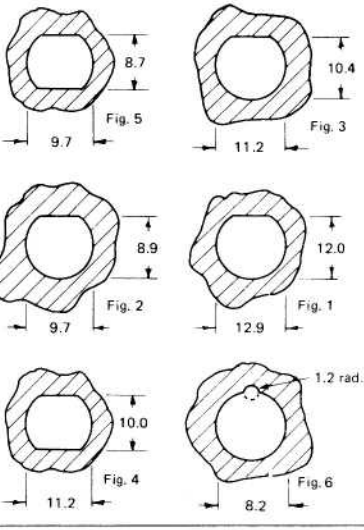


Connector outline	Dim. A	Dim. B	Greenpar No. 50ohm	Greenpar No. 75ohm	MOUNTING DETAILS	MOUNTING HOLES
PANEL SOCKETS						
			35006	37506	 Dimension C: rear mounting – 11.2 Dimension D: front mounting – 8.0	3 - 56 UNF – E 4 - 40 UNC – F 6BA – G 3.0 mm. dia – H 2.8 mm dia. – K
			35007	37507	 Dimension C: rear mounting – 11.2 Dimension D: front mounting – 8.0	3 - 56 UNF – E 4 - 40 UNC – F 6BA – G 3.0 mm. dia – **H** 2.8 mm dia. – K
			35083	37583	 Dimension C: rear mounting – 11.2 Dimension D: front mounting – 8.0	3.2 mm. dia. – H 6 - 32 UNC – J 4.75 mm. dia. – L
			35085	37585	 Dimension C: rear mounting – 11.2 Dimension D: front mounting – 8.0	3.2 mm. dia. – H 6 - 32 UNC – J 4.75 mm. dia. – L
		17.0	35014 35015	37514		3 - 56 UNF – E 4 - 40 UNC – F 6BA – G 3.0 mm. dia – H 2.8 mm dia. – K
STRIPLINE SOCKET						
			35065		 Dimension C: rear mounting – 11.2 Dimension D: front mounting – 8.0 Socket contact on rear face to accept pin 1.35 mm dia.	3 - 56 UNF – E 4 - 40 UNC – F 6BA – G 3.0 mm. dia – H 2.8 mm dia. – K

BNC 50 ohm and 75 ohm series

BULKHEAD SOCKETS

Connector outline	Dim A	B	C	Greenpar 50-ohm	No. 75-ohm	
BULKHEAD SOCKETS						**PANEL PIERCING**
		5.3		35026	37526	Fig. 2
				35027	37527	Fig. 2
				35029	37529	Fig. 3
				35063	37563	Fig. 5
				35066	37566	Fig. 4
	15.8	3.2		35084	37584	Fig. 1
				35166[6]	37166[6]	Fig. 2
	11.4			35183		Fig. 6
						
	14.3	7.4	13.7	35008[1]	37508[1]	
	12.7	9.2	12.0	35013	37513	
	14.3	6.1	15.1	35041[1]		
	12.7	9.2	12.0	35043[6]		Fig. 2
	14.3	8.2	12.3	35062[7]	37562[7]	



Notes.

1. Panel sealed items.
4. Nylon insulating bushes are available for items using panel cut-out Fig. 2.
5. All items can be supplied with a solder tag
6. Flats on these connectors are at 90° to the bayonet pips.
7. Panel insulated types, using nylon insulating bushes.
8. Nylon insulating bushes are available for items using panel cut-out Fig. 1.

....then there was this advertisement spotted in an American amateur radio magazine.
What next.....?

SHOW ROUNDUP

This years BATC show was again held at the Post House Hotel in Leicester. As an experiment, the date had been moved forward to May 22nd. Judging by the very large attendance and comments from exhibitors, this seems to have been a shrewd move. Companies reported brisk trade throughout and some have even requested a repeat performance later in the year! (see elsewhere in this issue).

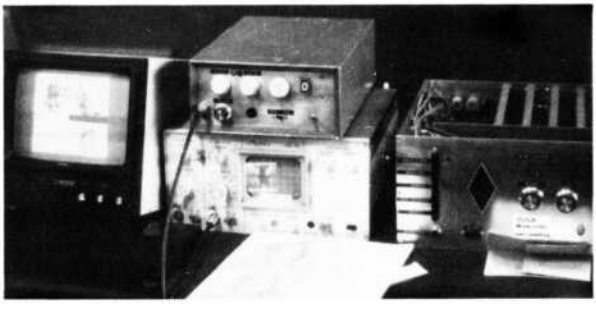
Those organisations present included:-

Ant Products
Wood and Douglas
Fortop Ltd.
Premier Pattern Making Co. Ltd.
Leicester Repeater Group
The BATC
Q-Studios
PLM Communication Supplies
Amtec Electronics
N.B.T.V. Association
Grant-Dixon (SSTV display)
G4EQD and G3CCH (colour SSTV)

Since space is at a premium in this issue, it is not possible to give more than brief details of some of the exhibitors.

The Leicester ATV repeater

It is interesting to see the amount of FM-TV equipment emerging onto the ATV scene. Fortop Ltd., had two brand-new designs to show. Their TVT1300 FM-TV transmitter for 24cm looks sure to be another winner. Features include; switchable two-channel facility - very forward looking this. It means that you won't have to choose between dedicating your TX either to the local ATV repeater or simplex channel. Normal or invert video, switched pre-emphasis (CCIR), 6MHz i/c sound, dual video and sound inputs, up to 2.5W RF out and a single 12v supply. The TVR1300 FM-TV receiver is very neat. It tunes the complete 1.3GHz band, has normal or invert video, switchable de-emphasis, sound, video output and audio output.



MEMBERS SERVICES

Items from these lists are available to club members only.
This list supercedes all previous ones.

	PRINTED CIRCUIT BOARDS			
	'Project 100' sync generator (CQ-TV100	£3.00	0.30	
	TX-9 video/audio in/out (CQ-TV119)	£2.25	0.30	
	FM-TV demodulator (CQ-TV122)	£2.25	0.30	
	"Amateur Television Handbook - vol.1"			
	Wide-band 70cm ATV tuner	£3.00	0.30	
	Amateur television receiver	£1.50	0.30	
	Electronic character generator	£3.00	0.30	
	Colour test card (set of 3-double-sided)	£15.00	0.60	
	Horizontal aperture corrector	£3.00	0.30	
	PAL colour coder	£3.00	0.30	
	"Amateur Television Handbook-vol.2"			
	Vision switcher matrix	POA		
	Vision switcher logic	£4.00	0.30	
	Vision mixer	POA		
	70cm VSB transmitter-7 boards, printed	£15.00	0,40	
	SSTV pattern/sync generator	POA		
	Character colourizer, (PRINTED LEGENDS)	£5.00	0.30	
	Piggy-back keyboard	£2.25	0.20	
	"TV for Amateurs"			
	70cm TV transmitter (also CQ-TV122)	£3.00	0.30	
	ATV up-converter (also CQ-TV112)	£2.25	0.30	
	Video filter (also CQ-TV122)	£1.00	0.16	
	STATIONERY AND ACCESSORIES			
	BATC test card - with data sheet	0.50	0.24	
	BATC reporting chart (illustrated)	0.12	0.20	
	BATC lapel badge - diamond - button hole	0.40	0.16	

	BATC lapel badge - round - pin fastening	0.50	0.16	
	BATC callsign* lapel badge-pin fastening *Write callsign CLEARLY. Sent by supplier	£1.50	nil	
	BATC key fob	0.60	0.16	
	BATC equipment stickers - 1" round	0.15	0.16	
	BATC windscreen stickers - 2.5" round	0.10	0.16	
	COMPONENTS			
	1" Vidicon scan-coils (low Z focus coils)	£6.00	£1.20	
	1" Vidicon scan-coils (high Z focus coils)	£6.00	£1.20	
	2/3" Vidicon scan-coils	£6.00	0.80	
	Vidicon bases - 1" or 2/3" (state which)	0.50	0.16	
	TV camera lens mounts - 'C' type	£1.00	0.24	
	13.14MHz TV TX crystal (Hbk 2)	£5.00	0,16	
	108MHz TV TX crystal (TV for Am)	£6.00	0.16	
	5MHz SPG crystal (P100)	£2.75	0.16	
	TBP28122 PROM. Pre-programmed for colour test card circle. (eqt.74S471)	£10.00	0.25	
	2732 EPROM. Slow-scan program	£12.00	0.16	
	4.433618MHz PAL colour subcarrier crystal**	0.40	nil	
	Colour TV delay line**	0.60	nil	
	**surplus, untested.	TOTAL		
		*postage		
	CAMERA TUBES	TOTAL ENCLOSED		

Members requiring EEV Leddicon, EMI 9777 Ebitron, 9728, 9706, 9677 (1" EMI) vidicons or 9831 (2/3" EMI) vidicon should enquire for the latest prices and delivery. ALL enquiries needing a reply should include a SAE or IRC.
OVERSEAS MEMBERS should ask for a quotation of postage costs before ordering.
PUBLICATIONS must be ordered separately from the Publications Department.
CHEQUES are payable to "The BATC" and should be for English banks only please
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	CQ-TV BACK ISSUES. The following issues are still available although stocks of some are low. Please circle those required.			
_____	68,88,89,90,91,92.....	0.25	*	_____
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_____	INDEX. All main articles in past issues of CQ-TV and 4 Hanbooks. Inc. page count, (essential for ordering re-prints).	£1.00	nil	_____

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AUSTRALIA

Would Australian members please note that the "AMATEUR TELEVISION HANDBOOK" Vol.1 is available direct from the Wireless Institute of Australia at: PO Box 150, Toorak, Victoria 3142. Please enquire for volume 2 and "TV FOR AMATEURS".

All other orders please to:- BATC PUBLICATIONS, 14 LILAC AVENUE, LEICESTER LE5 1FN.

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PLEASE DETACH HERE

LOOK coming soon...

A TV DAY-OUT

Q-STUDIOS, TOGETHER WITH THE BATC ARE TO ORGANISE A TV EXTRAVAGANZA AT THEIR TV STUDIOS IN QUENIBOROUGH, LEICESTER LATER IN THE YEAR.

THERE WILL BE SO MUCH TO SEE AND DO THAT YOU WON'T WANT TO MISS IT. AMONG THE TRADE STANDS WILL BE: Q-STUDIOS, WOOD & DOUGLAS, MICROWAVE MODULES, FORTOP, ANT PRODUCTS, PREMIER PATTERN MAKING Co. AND THE BATC. THERE WILL BE FACILITIES FOR MEMBERS TO BRING THEIR OWN EQUIPMENT FOR SALE.

THE DAYS ACTIVITIES WILL INCLUDE:

★ VIDEO STUDIO DEMONSTRATIONS ★ 24-TRACK SOUND RECORDING DEMONSTRATIONS

★ SHORT ENTERTAINMENT SHOWS (to demonstrate the above techniques)

★ A FULL LECTURE PROGRAMME ★ MEMBERS DISPLAYS ★ STATIC DISPLAYS

★ CLUB VIDEO SHOWS ★ ALL-DAY BAR ★ SNACK BAR

LUNCH WILL BE AVAILABLE NEARBY (A CHOICE OF TWO NICE PUBS) AND ALSO - FOR UP-MARKET MEMBERS - AT QUENIBOROUGH HALL HOTEL AT WHICH OVERNIGHT ACCOMODATION IS ALSO AVAILABLE AT VERY MODEST COST. ('PHONE LEICESTER (0533) 605751.

A TAXI SERVICE FROM LONDON ROAD RAILWAY STATION WILL BE AVAILABLE BY PRIOR ARRANGEMENT.

TALK-IN WILL BE ON 2m (S22) and 70cm (SU8).

ADMISSION FREE. DOORS OPEN 11am, CLOSING 4.30pm.

FULL DETAILS WILL APPEAR IN THE NEXT ISSUE OF CQ-TV MAGAZINE.

FOR FURTHER INFORMATION CONTACT PAUL ELLIOTT ON LEICESTER (0533) 553293 (day) or LEICESTER (0533) 606986 (evenings).

OK!

NOVEMBER 20th.

SEE YOU THERE

Glamour on the Wood & Douglas stand

Still on FM, Wood and Douglas had a nice stand again this year. Demonstrations included 10GHz 2.3GHz and 1.3GHz TV. Their modules were available including the FM units (although adverts have been scarce). The FM IF board was available at a special offer price of £35.

New to the ATV show was Ant Products. They were showing an interesting range of 2m, 70cm and 23cm aerials. These models feature a silver plated driven element.

Amtech Electronics represented the computer age by demonstrating graphics and SSTV programs for the Spectrum

Someone had a humanoid computer controlled robot, which seemed a little temperamental at times, and there were the usual bring and buy stalls together with member's equipment displays.

Thanks again to Trevor Brown and Paul Elliot for arranging the show.

(Photo's by G8DLX)

Caught by the camera; past BATC Chairman Malcolm Sparrow (L) and past committee member Tom Mitchel.

The home of F3YX. Probably France's leading ATV station. QTH - 30km South-West of Paris.

Book review

VHF-UHF MANUAL

Editor: G.R. Jessop, G6JP
528 pages; Hardback
246 x 184mm; Published March 1983 by
the Radio Society of Great Britain.

"The last edition of the VHF/UHF Manual gained worldwide acceptance as the standard handbook for amateur radio on VHF, UHF and microwaves.

This fully revised and greatly expanded fourth edition now builds on that well-deserved reputation. As before, it provides a wealth of design and constructional information for a wide variety of equipments, including some previously unpublished designs, while those chapters dealing with aerials, microwaves and propogation have been completely rewritten to reflect recent developments in these fields.

Chapter titles include: Historical perspectives; Propogation; Tuned circuits; Receivers; Transmitters; Integrated equipment; Filters; Antennas; Microwaves; Space communications; Test equipment; plus an apppendix of useful data".

PROPOGATION

This is a very useful chapter detailing the theory behind the propogation of radio waves between VHF and microwaves. It contains a wealth of data and practical information including propogation study reports and charts.

TUNED CIRCUITS

You may be wondering why a complete chapter should be devoted just to tuned circuits. Those experienced in UHF and microwave techniques will know that tuned circuits bear little resemblance to the traditional coil and capacitor. At these frequencies you enter the world of striplines and cavities. Such techniques take a bit of getting used to which is why this chapter is so comprehensive.

RECEIVERS

This chapter contains all the background theory to this large subject and includes many practical circuits for converters, tuners, IF strips, Pre-amplifiers and just about every other circuit you may require.

TRANSMITTERS

Again a comprehensive chapter. Practical designs range from QRP solid-state transmitters at various frequencies to high-power valved amplifiers. This chapter also contains about five pages devoted to the subject of amateur television, about which more later.

INTEGRATED EQUIPMENT

A new chapter to the VHF/UHF manual. This section contains practical how-to-do-it details for the construction of complete equipment such as transmitters, receivers and transceivers, including some of the more modern synthesised equipment.

FILTERS

Filtering of signals at high frequencies is a very necessary part of the station. It is also one of the hardest subjects to understand and apply. This chapter ably deals with all aspects of signal filtering containing, as it does, several tried and tested designs.

ANTENNAS

Always a large section, this chapter discusses the theory and constructional techniques used in aerial design. Practical details are given enabling the reader to construct suitable aerials from a wide range of designs.

MICROWAVES

Owing to the specialised nature of the world above 1GHz, it has been found necessary to devote a separate chapter to this subject. It is all here; Everything you need to know about operation between 1 and 24GHz. Anyone interested in microwaves will find this chapter invaluable.

SPACE COMMUNICATIONS

An acknowledgement to modern technology, this section deals with satellites in the amateur service. Details of all satellites so far are included together with information on the use of such spacecraft by amateurs.
The technical and practical sides are quite comprehensively covered.

TEST EQUIPMENT AND ACCESSORIES

As it's title suggests, this chapter explains in detail the various measurement and testing techniques used at VHF and above. Always a source of concern to the amateur (commercial test equipment being so expensive) this chapter gives practical information on building and using test equipment which, although at times fairly straightforward in design, is adequate for amateur purposes.

DATA

A very useful section at the rear of the book, this covers everything from the resistance colour code, through RF cables and connectors to resonant frequency and inductance charts.

AMATEUR TELEVISION

I was very pleased to see that at last, fast-scan amateur television has been given a place in an RSGB handbook. The material however is somewhat disappointing. The section (in the Transmitters chapter), starts out by explaining the principles of scanning and moves on to a discussion of TV standards, modulation, video and signal processing and bandwidth and channel space. There is much discussion on the theory behind ATV so what about practical circuits to help those new to the hobby? I looked for a receive converter, or even details on the use of varicap TV tuners, perhaps a small transmitter, but no. Of all the material available, Mr.Jessop came up with two sync pulse generators - and one of those was an all transistor 405-line design from an old CQ-TV (with "modern" 625 -line component values in perenthesis)! The only other circuit is a video modulator using a pair of valves in the output, suitable for modulating a QQV03-20 type valved amplifier.

Considering the upsurge in ATV during recent years, together with a vast amount of technical and very practical material in CQ-TV and other journals, I feel that this attempt at coverage in such a "standard" handbook, is nothing short of pathetic. I'm sure Mr.Jessop does not realize that ATV is easily as up to date as all other aspects of amateur radio, and therefore he probably thinks that this information reflects the current state of amateur TV. I believe that the gentleman who wrote the section is an old hand. I wonder if he still reads CQ-TV!

CONCLUSIONS

This book has, for many years, been one of the best works of it's kind available to radio amateurs. Unfortunately the RSGB seems unable to let go of all the old and outdated material which has been a feature of earlier editions. Those of you who have an earlier version will no doubt compare the contents with this latest volume.

It's all there! The valved receiver circuits, the Nuvistor converters, the 70cm converter using a couple of 6J6's and a Z77. Although there is of course still room for valves, especially in transmitting equipment, do we still need circuits of valved phase modulators, crystal oscillators, audio amplifiers and mixers? The power amplifier circuits are still here also, and rightly so, however even some of these could do with a face-lift. That notorious 23cm strip-line tripler or amplifier based on a 'standard' diecast box, which has given so much trouble to so many is still there in all it's old glory. The alternative 23cm tripler using a sliding grid tray is also included, and I am pleased to see a few modifications to it which should help constructors.

With the greatest respect to Mr.Jessp who has, down the years, produced some very good books which have done much for the furtherance of amateur radio. This book illustrates that perhaps it is time for some new thinking and a realization of the rapid advancement in radio and electronics. To be fair, there is much new material contained in the manual, but one is left with the feeling that this has been inserted in a largely outdated manuscript in order that the book should appear to reflect current trends.

In my opinion, if the older material had been dropped, even though it would have meant a slimmer volume, the result would have been so much better and more favourably received by the old hand as well as the newcomer.

At it's price - £10.31p inc. postage - the book is good value. Considering the quality of it's presentation and binding, the VHF/UHF manual still represents one of the most complete works of it's kind, therefore I have no hesitation in recommending it for the shack bookshelf.

IS THERE A LAWYER IN THE HOUSE?

Occasionally, guidance or advice is needed on a point of law concerning CQ-TV magazine or the general running of the Club.

With such a large membership, it seems likely that among you there is someone who could help.

Would any suitably qualified member who is prepared to offer some assistance, please contact the Editor; John L. Wood. 47 Crick Road, Hillmorton, Rugby CV21 4DU Tel: 0788 69447

A 70cm LINEAR

by R Platts G8OZP.

INTRODUCTION

The linear amplifier described here was designed as a driver for a high power ATV transmitter and also as the output stage of a portable rig. The output power was measured as six watts for 800mW of drive. The linear is very stable and quite tolerant of mismatches.

CIRCUIT DESCRIPTION

Drive power is applied to a simple 'L' tuned circuit which matches the input into Tr1. Base bias is provided via RFC1 and is held constant by a zener stabilisation circuit. +ve is applied to the collector via RFC2. The multiple decoupling of the supply rail is to ensure that all frequencies (from sync to RF) likely to be encountered in a TV transmitter are catered for. The ouput tuned circuit consists of a standard 'T' network comprising a printed stripline (L2) centre tapped by C6. C7 and C8 provide DC isolation of the output signal which is passed to the coaxial connector via a printed stripline, dimensioned to preserve the correct output impedance.

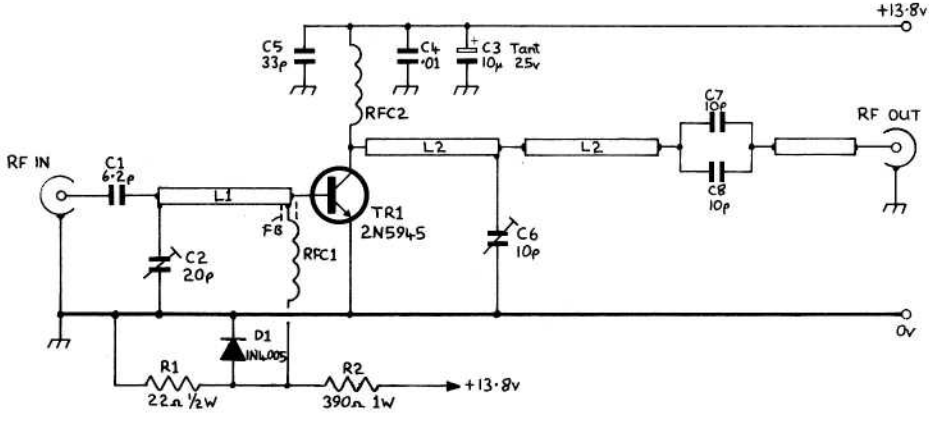


Fig.1 70cm LINEAR AMPLIFIER CIRCUIT DIAGRAM

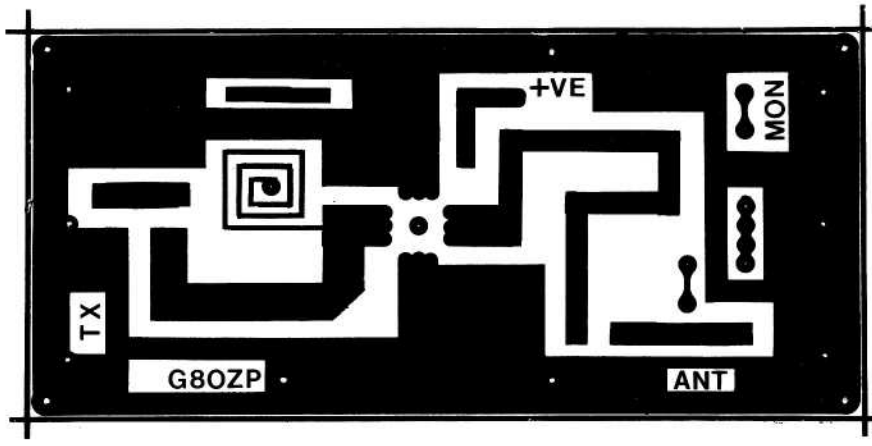


Fig.2 PRINTED CIRCUIT PATTERN (actual size)

CONSTRUCTION

A printed circuit board may be made according to the artwork in fig 2. Good quality double-sided fibre glass board should be used. Photo etching can be employed or alternativly the print layout may be drawn on the board with a Dalo etch resist pen. Drawing on the board in pencil then painting in or masking using rub down transfers is another method. The underside is left unetched and can be masked over easily by coating with aerosol paint which, after etching, can be removed with thinners. The nine holes around the edge can now be drilled and a suitable sized hole for Tr2 made in the position indicated, carefully filing the slots as shown in fig 4.

Cut the two emitter leads of Tr1 to half their original length but leave the collector lead slightly longer to help in the correct positioning of the transistor. The offcuts are soldered to the emitter lead pads on the ground-plane, and bent through the mounting hole of Tr1 to sit in the slots filed in the board (see fig 5), these are then soldered onto the lower ground-plane. Nine pieces of wire (off cuts from component leads do the job) are fitted through the holes on the board and soldered top and bottom to join the two ground-planes. All components mount on the printed side of the board. The capacitors and resistors should have their leads bent at 90 degrees as close as possible to the component body and soldered in position as shown in fig 3, they must fit close to the board.

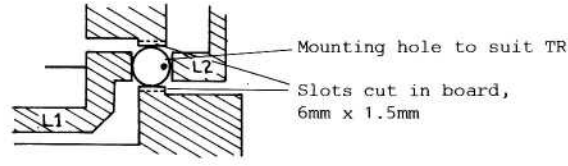


Fig.4 DETAIL OF PRINTED BOARD SHOWING TR1 FITTING METHOD.

RFC1 is made by soldering a short length of wire vertically onto the centre pad of the printed inductor L1. Thread a small ferrite

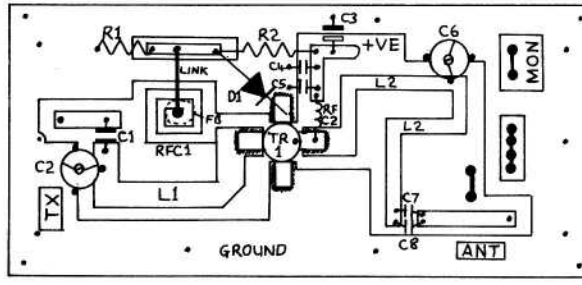


Fig.3 COMPONENT LAYOUT

bead over the wire and bend it over to connect with the junction of R1 and R2 leaving the ferrite bead vertical on L1. Tr1 dissipates approximately five watts so it should be mounted on a suitable heatsink. In the authors prototype the amplifier is fitted into a 4.5" x 2.5" x 1.25" diecast box, this has the added advantage of providing an adequate heatsink for the transistors. Carefully fit the transistor as shown in the diagram and solder each lead in turn using a hot iron, holding down the tabs with a small screwdriver will prevent them springing away from the track, allow time for the device to cool before continuing. RFC2 is mounted close to the body of Tr1 and stands a quarter of an inch above the pcb. It is not necessary to mount D1 across the transistor as in high powered amplifiers.

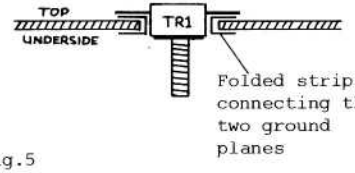
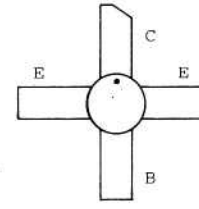


Fig.5



2N5945
Top view

Fig.6

If coax is used for input and output conections keep the exposed length of inner conductor to a minimum. The outer braid should be divided into two tails and soldered to the top ground plane, either side of the coax inner. If the transmitter is fitted into a die-cast box, good quality BNC sockets should be fitted adjacent to the input and output connections and short wire links used to connect the sockets to the board. When the unit is complete, remove flux deposits with alcohol or a good flux solvent and check the board for solder bridges and dry joints and also for correct component placement (see fig 3).

ALIGNMENT

Connect a power meter and dummy load to the output of the amplifier and a drive of about 300-800mW to the input. Connect a 0-1Amp meter in the supply line and apply 12volts dc whereupon a small standing current should show on the meter. This varies with different devices so no actual value is given (although about 20mA is typical) but it should not exceed 100mA. If it does SWITCH OFF IMMEDIATELY and check the board thoroughly for errors.

If all seems well, adjust C2 and 6 for maximum output. Do not allow the supply current to exceed 800mA which is Tr1's maximum rating, if necessary reduce drive power to keep the current in check.
NOTE:- L2 requires only a small amount of capacitance to become resonant so C6 will be nearly unmeshed.

CONCLUSION

The amplifier will tune down to 420Mhz enabling it to be used with a varactor tripler for 24cms, in this case the amplifier can be run in class C by removing R1 and R2 and connecting RFC1 to ground. Extra pads are provided on the board for a diode probe monitor to be built, circuits of which have been published in CQ-TV and in 'Amateur Television Handbook 1'. The transmitter featured in the last issue of CQ-TV may be used to drive this unit although there may not be quite enough drive available to realise the amplifiers full output.

BATC 1983 WINTER ACTIVITY CONTEST

DATES: 8th/16th/24th Nov - 2nd/10th Dec. 1983
TIME: 20.00 - 23.00 GMT each day
SCORING: Logs have to be entered per band operated - a maximum of three sessions will count for points - if you operate on more please enclose details for checking purposes.
A) Two-way QSO on 70cm: 2 points/km
B) Two-way QSO on 23cm: 8 points/km
C) Two-way QSO on 3cm: 16 points/km.
Multi-op stations may only use one callsign.
Crossband QSO's must be entered in the log for the transmit band.
EXCHANGES: The following data is to be exchanged:
1. Code-group, which consists of four digits, individually chosen by each entrant, i.e. 1865 or 9732. The code group must be exchanged in video only.
2. Call, QTH-locator, report, serial number starting at 001 each session, this data to be exchanged via video or phone.
Should one of the stations fail in receiving the picture of the other , the scores of both stations are to be halved.
Please QSY from the ATV calling channel of 144.750 as soon as contact has been established.
Please keep vision transmissions as short as possible.

CONTACTS: The same station may only be contacted once per band on each night.

LOGS: Must include postal address, locator and station details and be mailed not later than 15th January 1984 :-

G. SHIRVILLE G3VZV
18 Church End,
Milton Bryan,
Milton Keynes,
Buckinghamshire MK17 9HR.

H 100 - A NEW COAXIAL CABLE FOR UHF

As operating frequencies increase, so do the demands made on coaxial cables feeding high-gain aerials. It is not uncommon at UHF to lose more than 75% of your signal (both transmitted and received) in a typical length cable run. Now that more stations are becoming active on 24cm the problem is even more apparent.

The two cables most commonly used by amateurs are UR67 and Andrew Heliax. The former is relatively lossy but 'affordable' and the latter is good but very expensive and needs special coaxial connectors. A new cable on the British market may be the answer to our problems.

W.H.Westlake from West Park, Clawton, Holsworthy, Devon EX22 6QN are marketing the Pope H100 Super Low-Loss 50-ohm coaxial cable. This product, although similar in outward appearance to UR67, has a much improved specification together with a price tag which doesn't frighten you.

H100 is noticably lighter than other cables. It fits normal PL259 (UHF) and 'N' type plugs. It uses a helical membrane around the centre conductor therefore the cable ends need to be weather sealed where there is a risk of water contamination. Maximum screening efficiency is assured by using a closed copper foil and a braiding for the outer conductor.

H100 is available price 80p per metre (plus 5p/M post). Quantity discounts are available: 50M, less 10%, 100M, less 20%. A large SAE will bring you further details and a sample.

H100

	H 100
Diameter:	
Overall:	**9,8 mm**
Central conductor:	**solid 2,5 mm**
Nom attenuation in dB/100 m:	
28 MHz	**2,2 dB**
144 MHz	**5,5 dB**
432 MHz	**9,1 dB**
1296 MHz	**15. dB**
Maximum power: (FM)	
28 MHz	**2100 W**
144 MHz	**1000 W**
432 MHz	**530 W**
1296 MHz	**300 W**
Weight:	**112 g/m**
Minimum operating temperature:	**– 50°C**
Bending radius:	**150 mm**
Rated Velocity Ratio:	**0,84**
Colour:	**black**
Capacity:	**80 pF/m**

SPECIFICATION FOR 1240/1325 MHz BAND TELEVISION "REPEATER" STATION

The following notes are taken from the proposed specifications document drawn up by the repeater working group in October 1982, and submitted to the Home Office.

The purpose of publishing these selected notes is to enable stations intending to use ATV repeaters to decide upon the correct specification for their intended equipment.

It is possible that certain specifications contained here may be altered by the H.O. before the licences are granted.

1. RECEIVER

1.1(a) The receiver bandwidth shall be suitable for reception of a 625-line FM television signal having a deviation of ± 6.5MHz and pre-emphasis to CCIR recommendation 405/1. The vision receiver will be able to accept a frequency modulated signal and the audio receiver will be able to accept a frequency or phase modulated signal spaced at 6MHz from the vision frequency, modulated to a peak deviation of 50KHz with not more than 10% distortion in the range 300 - 10,000Hz.

1.1(b) The receiver bandwidth shall be suitable for reception of both double sideband 625-line AM television signals, and those corresponding to CCIR system I standards. The vision receiver will be able to accept an amplitude modulated signal and the audio receiver will be able to accept a frequency or phase modulated signal at 6MHz above the vision frequency, modulated to a peak deviation of 50KHz with not more than 10% distortion in the range 300 - 10,000Hz.

1.1(c) Receivers shall be provided for both systems as described in 1.1(a) and 1.1(b) above.

1.2 The receiver audio bandwidth will be 300Hz to 10,000Hz, the ±1.0dB audio frequencies at 13KHz will be suppressed by at least 20dB with respect to a reference tone at 1KHz.

2. TRANSMITTER

2.1(a) The transmitter to be used will be modulated by 625-line video and sound signals using the F5/F3 modes respectively with the video deviation being limited to ±6.5MHz and pre-emphasised in accordance with CCIR recommendation 405/1 and with the audio deviation being ±50KHz spaced 6MHz from the video carrier.

2.1(b) The transmitter to be used will be modulated by video and sound signals in accordance with CCIR system "I" specification. Vision A5 mode and sound F3 mode. Modulation of the audio transmitter shall have a peak deviation of ±50KHz.

3. IDENTIFICATION

3.1 In talk-through mode, identification of the station will be accomplished by modulating the audio transmitter by an automatic call-sign generator, using F2 modulation in the International Morse Code at a nominal speed of 12 words per minute. Identification shall occur at periods of not greater than 15 minutes and the identification tone will be in the mid-audio range and have a deviation not exceeding ±10KHz.

3.2 The video transmitter will identify with it's callsign and mode of operation, being displayed with a letter height of not less than 10% of total vertical scan.

3.3 When not in "talk-through" mode, the repeater will identify itself at least every 15 minutes with callsign sent in morse code and with a callsign caption on vision as in (3.1) above.

4. ACCESS AND CONTROL

4.1 The "talk-through" mode of the station may be accessed by receipt of a valid video signal at the receiver input having approximately 30% synchronisation pulse modulation.

4.2 When the accessing signal is removed and the repeater is not re-accessed within 10 seconds, the repeater will: Sound carrier - send a "K" in morse code and transmit carrier for at least 30 seconds with call sign in morse code at 30 second intervals. Vision carrier - Send a call sign caption for at least 30 seconds.

Reporter wanted

Do you go to the BATC shows and conventions, and sometimes perhaps to rallies at which the BATC is represented? If so you could be the person CQ-TV magazine is looking for.

The Editor requires someone to compile reports on such events for inclusion in the magazine. You don't need to be expert, just so long as you can string a sentence together!

The Editor would also like to hear from anyone who can lend a hand in editing technical articles. No artwork required, just an ability to prepare the copy prior to typing-up. A reasonable technical knowledge of ATV techniques is essential.

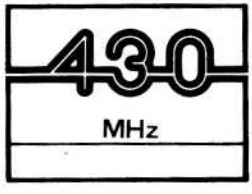
The jobs are unpaid although expenses will be met. Please help the Club (and the Editor) by contacting John Wood G3YQC at 47 Crick Road, Hillmorton, Rugby CV21 4DU. Tel: 0788 69447

TV ON THE AIR

Welcome again to TV on the Air, the part of the magazine where we recount what you have been getting up to. But just before that a word to those of you who sent in letters and photographs, or told me your latest news at the superb ATV show in Leicester on the 22nd May. Many thanks to all of you - it's a pleasure to hear from you and I can always do with more material for this column. All contributions are welcome, from old stagers and newcomers alike. It's strange but most of the copy for this column comes two days after I have typed it up ... but even if it's late I will always use it in the next issue! Nowadays I prepare the column on the BBC computer and send the copy as a tape cassette to the editor, ready for feeding into the CQ-TV computer typesetting machine.

Incidentally, I have at last received more news from SSTVers so I can happily conclude that the mode is not dead after all. Seriously, do write in all you SSTVers if you wish to reverse the bias towards fast-scan in these notes.

Talking of promotion for fast-scan, you will probably have noted the publicity we have been getting in the monthly ham magazines lately. It started with Trevor G8CJS's series of articles in "Ham Radio Today" (also a scene-setter by yours truly), then an excellent feature by the Home Counties team in "Amateur Radio", and finally we now have a monthly spot in the newly communications-orientated "Radio & Electronics World". To ensure the continuance of the latter please write in plenty of letters to "R & EW" saying how you appreciate a monthly ATV column, otherwise they may replace it with articles on RTTY or something! That's enough for the preamble, so I shall now launch into the hard-core operating details.



Mobile TV is our first mention on 70cm: I hear that G4BAV is 'at it' in the Ipswich area, but further details are missing. Amazing what you pick up from other people ... New station just north of Canterbury is G8KUC at the University of Kent. They have installed a MM transmitter in their club shack and are feeding it with video from an Acorn computer. Contacts to date include Tony G6EXU in Ashford and yours truly in Blean. G6EXU has had a number of other contacts lately, such as G8PPQ (Ide Hill, 700ft ASL), G4NYO in Crowborough and G6VHL in Hawkhurst. The last mentioned, John G6VHL, is suffering from the classic TVI problem - a communal aerial system with the wrong group aerials, a 'DC to light' wideband preamp and incredibly weak off-air broadcast TV signals. John's ATV transmissions wipe out Channel 4, yet the authorities responsible for the aerial system refuse to renew it. In the meantime the Buzbies have declared John's ATV transmissions 'clean' but he has to live with the neighbour problems. If you don't suffer in this way perhaps you should count your blessings ...

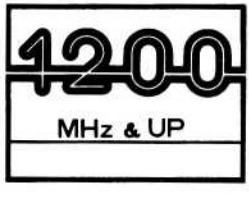
In Wallington, Surrey, Ted G6CTV announces he is now QRV with lovely high quality colour.It seems he got a Hitachi 1020 camera at a 'silly' price and now he can justify that CTV call. The letters CTV came by accident, by the way. Some stations in the north- west have been getting extra QSL cards lately: Andy Webster, an SWL from Billinge near Wigan, tells me he has logged G3RLA (Heswall), GW6NUO, G8VHF (pirate?), G8VPH (Sutton Coldfield) and GW8XLL (Rhyl) during his DX-TV watches. A couple were also logged by TV-DXer Arthur Milliken (also Wigan) using his Panasonic 7000 vcr's tuner, which covers 70.

Nick Foot G8MCQ wrote a fine letter from Wimborne detailing the stations active several nights of the week in his neck of the woods (New Forest, joke, geddit?). Oh well, here they are:

G8MCQ/G6TEA Wimborne; G6MPA Northbourne; G6IAC Ringwood colour; G6MYU West Moors colour; G2HCG Barton on Sea; G8MCP Corfe Mullen; G4BGT/G6JGR Corfe Mullen colour; G6OAI Poole colour; G6JAT Parkstone colour; G8CMQ Southampton; G4JQU Southampton; G6CPE Romsey; G6COB Southampton; G4JXC Romsey; G4MHF Broadstone.

Many stations have built upconverters (mainly PW design) and are thinking of building transmitters, Nick says. Of the transmitting stations, most apparently run 5 to 10 watts though Nick runs 50 watts (2C39 homebrew PA) and G4MHF 100 watts (MM solid state PA). The 2C39 PA design came from a 1974 issue of "VHF Comms" and has just been reprinted in the "UHF Compendium", available from RSGB sales. (I too have bought this marvellous book: it's the size of a telephone directory, full of 70 cm and 23 cm info and knocks spots off the RSGB joke VHF manual of museum piece information. Have you seen the super 405 line circuits in the latest 1983 edition??? - G8PTH) Nick also had TVI problems, which could be cured only by installing filters ahead of people's masthead preamps.

One more 70 cm letter and that's from Ray Hill G6TSL in Ross on Wye, Herefordshire. With 3 watts from a Wood & Douglas ATV1 he has worked Grant G8CGK (4 miles), Neil G6TZA (7 miles), GW4RZE/GW6PMF/P (5 miles) and Chris G8TPS/P at Kington Golf Course (P2 pix over a 30 mile path - not bad ...). On Friday 13th May he sent pictures to Grant who was giving a talk to the local Round Table on SSTV. The meeting opened and Grant announced over the air from Ray's QTH. On the 14th and 15th a demonstration station was set up at a scout camp at Walford, not far away. Pix were sent from Ray's shack by G6TZA and received by G6TSL, GW4RZE and his brother in law. A brief talk was given on ATV, with explanations of the difference between amateur radio and CB! Ray welcomes any skeds and would like to see a circuit for a linear using a QQV06-40A.



On to higher things (or bands) and news is coming in fast. I said last time that I suspected there was some quarter-metre band TV in the London area and this is confirmed by Chris G8CIU (Bexley) who says he and Dick G8CTT (Chislehurst) have been swapping signals on 1308 MHz. They generate an AM signal on 427 MHz and put it through a MM varactor tripler; reception is with 23 cm to 2 metre converters feeding a VHF-UHF upverter and a normal TV! What's more it works - and passes colour ...

In the Worthing repeater area Martin G8KOE (East Preston) is already transmitting 24 cm TV to Roy G6AIW and Nick G4JEI. Roy acts as relay station and retransmits the signal on 70 to the stations 'round the corner' in Chichester! Moving to Essex now, John G30GX has 5 mW on 24 cm (good start) and hopes to swap signals with Nick G4IMO, who is also building when he isn't watching FM TV from the Russian satellite. Nick has put his F9FT 24 cm antenna on a Polyskop - says it's impedance is 50 ohms between 1240 and 1250, then rises alarmingly towards 1260.

Some while ago I mentioned the 150 watt PA available from muTek. Domestic reasons have prevented me from getting it on the air here, but Frazer G8FEZ is currently using it on 23 cm with a MM SSB transverter. The verdict is excellent ... Nick G8MCQ is also building for 24 cm, as is G6IAC; Nick hopes to have 50 watts and a 4 x 23 el. quad loop array fed with 0.5" heliax. He has an optical takeoff for at least 15 miles to the north and will be looking for contacts. A TV repeater is another possibility under active consideration. Several other stations are known to have transmitters nearly complete, so things should get busy soon.

Finally a bit of DX, like 2000 km! This snippet was lifted from the February 1983 issue of "Amateur Radio" (Australia). On the night of 19.11.1982 Reg VK5QR sent pictures 2000 km to Wally VK6WG on 1290 MHz. Reg was transmitting 100 watts and Wally received him with a MM two metre converter (144 MHz is Australian TV channel 5A). Recognisable pictures were passed between Albany and Adelaide, and I guess this must be a world ATV record. No silly AM versus FM quips, please!

Here and There
SSTV

Yes, we have three letters from SSTVers this time! Top of the pile is John G3YCV in Cliffsend, near Ramsgate, who has been active in SSTV on 20 metres and elsewhere for 15 years or more. Starting with flying spot scanners and 5FP7 tube receivers, John is now fully up to date with a SC160 scan converter modified for colour (assistance from G3NOX and DL2RZ gratefully acknowledged). One of John's colour photos is reproduced here, only in black and white I'm afraid, but they look fine. Tx tests, with a Pye Lynx camera, are just awaiting receipt of the correct colour filters. John is QTHR and will be happy to answer anyone's SSTV queries for the cost of a SAE. He says Tony G3VID, also in the Thanet area, is finishing a new scan converter.

Nick G8MCQ has a working slow to fast scan converter based on the JA0BZC design - any two metre SSTVers in the New Forest area who can send him signals? Finally, a welcome note from Dick G3LUI (Hullbridge, Essex). He says the Wednesday night SSTV net is going great guns (2030 hrs, 144.50 MHz). Current participants include G4BCH, G4KXN, G4IMO, G3NOX, G8UUL, G8BKE and G3LUI (Essex area). Also G3CDK, G3WCY,G4CZT, G4GZN, G3GRJ, G4PAL and G8ZWM (London area), G3WW (Cambs.), G8ASI (Hemel Hempstead) and G6IYD (Ashford, Kent). Successful 3D colour tests have been carried out between Jeremy G3NOX and several others, believed to be a UK 'first'. Peter G4BCH continues his battle to convert his all singing, all dancing version of the Robot 400 to colour, while Nick G4IMO, Roddy G3CDK and G3NOX are getting very good results interfacing computers with their Robot 400s. Dick's DL2RZ SC160 plus two homebrew memories is at last producing PAL colour via the BATC PAL coder and an ASTEC 1233 modulator.

Finally a plea to all SSTV stations using 144.50: please call CQ rather than just listen. After all, this is World Communication Year, says Dick!

That's it, a bumper bundle this time as it should be every time. Please keep those letters coming in. Jacques F6BQH has designed a SECAM coder compatible with the BATC project board system: I haven't tried it but it looks good. Circuit diagram, description and board layout can be had from me for a SAE. Send in your activity notes to me as well, and the address should have changed by the time you read this so please write to me care of the editor, G3YQC until I can give you my new address. Many thanks - Andy Emmerson, G8PTH.

AUSTRALIAN TV AMATEURS DENOUNCE "HAM" BROADCASTERS

The following passage is an extract from the South Australian Amateur Television Group Newsletter number 4, kindly sent by VK5KG:

> "Those of you who are presently actively transmitting ATV will be up to date on the story of the Kenwood Amateur Radio Club's attempt to set up a TV Semi-Broadcasting Station on 580 MHz in Sydney. For the benefit of those who are unaware of the affair or its implications the story is as follows...
> We became aware of their plans through articles in "Amateur Radio Action" and "Electronics News" in which it was claimed (amongst other things) that:-
> their "TV licence was granted by the Department of Communications which set aside UHF channel 34 for amateur users", the club "will operate from 7.30 pm to 10.30 pm Mondays to Fridays" and "plans to televise electronics-trade related courses...as well as documentaries from such organisations as CSIRO and NASA", Advanced programme schedules have been arranged and should be published in the TV GUIDE OF MOST SYDNEY NEWSPAPERS"!!!
>
> Apparently, when they got to hear about it, the Federation of Australian Commercial Television Stations lobbied the Department of Communications which stepped in to "read the riot act" to the Kenwood ARC. We felt strongly (and still do) that this whole turn of events is very dangerous to the future of ATV in Australia, and that we should publicly disassociate ourselves from the Kenwood ARC's action in the strongest manner possible".

TX-9 NOTES

by R.J Williams

These notes are intended to supplement the article by Alan Warne on the TX9 video interface* with further information based on the experience of converting a 22" set (model 3792). This was fitted with the early version of the TX9 chassis (coded 1001) and some of the information may not apply to the later version, or to the 14" set.

First some general points on connections to the main board. When making connections to PL5 remember that Pin 1 is nearest to the outer edge of the board, in some cases the overlay numbers pins in the reverse order. The reference to SAW IF 4/8 as the connection point for the video signal may cause confusion it is in fact Pin 8 of PL 4 (into which the SAW IF board plugs).

On the 1001 chassis the select buttons are wired differently from the diagram in the original artical. There is a bare wire connecting all the centre terminals apart from the one on button 6 (to which the 12v feed from Pin 5 of PL5, a green and white wire, is connected). The return connection to Pin 9 of PL5 is a yellow and white wire from the front terminal on button 6. This has to be shifted to the corresponding terminal on button 5 to enable this to take over the function of button 6. In its place is soldered the connection to the video interface board. Finally the bare wire has to be removed from the inner centre terminal of button 6 and the outer centre terminal of button 5, and a link fitted between the later and the corresponding terminal on button 6 to provide the 12v feed. This link can be fitted on the opposite face of the switch if more convenient, since the terminals are duplicated there.

Although designed for the "Movie Star" 14" portable, the interface adapts to the larger 22" set without major changes. Ideally the isolating transformer should be the next size up (120va) but in practice the 80va version, although running a trifle warm, seems to be adequate. This has to be mounted on the right hand side of the set (seen from the front), where there are two channels into which the heads of mounting screws or bolts can slide. The interface board should be mounted on an L shaped bracket as before, with the connecting sockets located on the short side of the L. If this is made no more than 1" wide the whole bracket can be fitted inside the plastic moulding which supports the aerial socket. There is a cut-out in the back cover of the set which will allow access to the sockets, but a corresponding hole must be cut in the moulding itself. Because of the restricted space a DIN socket has to be used for the audio connections. Alternatively the board can be mounted on the side of the cabinet, below the transformer, where there is a similar cut out.

Finally some points on constructing the interface itself. I used a kit supplied by Ambit International (their stock number 40-0009) which includes the board and board mounted components. In addition you will need aluminium

sheet for the bracket, screws and spacers to mount the board on the bracket, BNC video sockets DIN or phono audio sockets and connecting wire and cable. Video connections can be made with ordinary (not low loss) aerial lead. For audio connections twin (figure of eight) screened cable is the best, since this requires minimum enlargement of the hole in the main board to make connections to the sound IC.

The resistor for terminating video in is not supplied with the kit, this can be 68 Or 82 ohms and can be soldered across the socket terminals unless it is switchable for loop through. I preferred to solder all ground connections on the component side of the board, including those for input and output. This is much easier if done as components are inserted rather than being left to the end. To avoid interference on the video from RF, and vice versa it is essential to earth the screen of video connecting cables at both ends. If the interface board is mounted by the aerial socket the connecting cable to the channel select button should also be screened, though in this case only earthed at the board. The converted set is used with a video recorder and gives excellent picture quality which is clearly superior to the signal via the normal route. Alan Warne and John Wood are to be congratulated for their work in producing and making available a simple and inexpensive design which gives such good results.

*REFERENCES: CQ-TV 119 page 25
R & EW magazine November 1982.

A printed circuit board for this conversion is available from the BATC.

30 Years ago

The following list is taken from CQ-TV No.17 published in June 1953. It shows just how few active TV amateurs there were in those early days. It must have been very lonely!

CURRENT LIST OF BRITISH AMATEUR TELEVISION STATIONS

Call	Location	Vision freq/power	Sound freq/power	Standard
G2WJ/T	Nr.Dunmow Essex	437Mc/s 3W		200 line seq.
G3FNL/T	Upminster	445Mc/s 25W		405 interlace
G5ZT/T	Plymouth	427Mc/c 3W		200 line seq.
G3BLV/T	Sunderland	20W		405 interlace
G2DUS/T	Baldock	427Mc/s 3W		200 line seq.
GI3FWF/T	Belfast	437.75Mc/s 40W 2350Mc/s 0.5W	1753Kc/s 10W	405 interlace
G3CTS/T	S.London	429Mc/s 25W	425.5Mc/s 25W	505,625 inter
G3ACK	Blyth	426Mc/s 50W	422.5Mc/s 25W	405 interlace
G3CVO	Gerrards Cross	438.2Mc/s 6W	1805Kc/s 10W 145.1Mc/s 25W	405 interlace

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HANDBOOK 2 NOTES

A few gremlins have been spotted in the BATC Handbook Vol.2. They are as follows:

10GHz TV TRANSCEIVER

All the non-electrolytic capacitors shown with values ranging between 1uF and 68uF should have been shown as being between 1nF and 68nF (0.001uF and 0.068uF).

70cm V.S.B. TRANSMITTER

Fig.5. 1VT2 and 1VT3 should be BF196 and not as shown.

There are two capacitors marked 1C12. The 5pF gate to drain capacitor in 1VT1 should have been marked 1C13.

The capacitor marked twice as both 1C13 10n and 1C13 0.1 (!!)should read 1C14 10n. It is also wrongly marked as C4 on the printed circuit board. It between R2 and R4 on the PCB.

Fig.6. There are two capacitors marked 2C9. The 220pF at the input should be 2C10.

Fig.7. There are two capacitors marked 3C19. The 4n7 in the collector circuit of 3VT3 should read 3C20.

UHF DRIVER BOARD

The legend printing on this board has a couple of errors. There are two 616's shown. The one next to 'T2' is in fact 6L7. L4 is not marked on the board but fits where the designation 'T2' is printed.
The ferrite cores seem to be in short supply. Members Services have traced a suitable alternative and will be holding them in stock. Anyone requiring information in advance of the next issue should contact Members Services.

VIDEO SWITCHER

The 'Push Button' board for the Video Switcher has a couple of errors on the documentation which accompanies the PCB. 2 74LS138's are shown. The lower one should be 74LS148.
The part number for the push buttons should read KHC11091.
The appropriate corrections have been made to the current board documentation.

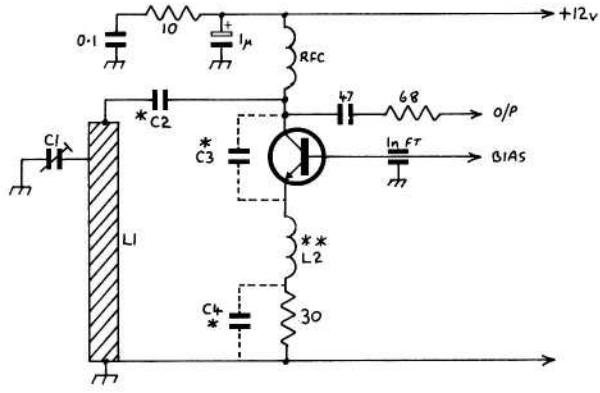
ANSWER TO NBTV PUZZLE

Mechanic = 20 lines. Electronic = 32 lines.

FM-TV TRANSMITTER

G3JVL has suggested some modifications to the 420MHz oscillator on page 72 and makes some observations based on experience.

The layout diagram shows a 4.7pF capacitor on the wrong side of the 1k resistor at the modulation input.



The transistor seems to be too tightly coupled to the resonator and the following modifications are suggested:

It may be found that sufficient stray circuit capacitance exists to obviate the need for C3 and C4. C3 and L2 resonate approximately at the required frequency. (adjust L2 rather than raise the value of C3). C2 should be kept small to keep the circuit Q high.
* Make these values as small as possible to ensure oscillation.
** If a small inductance is added here the internal capacity should be sufficient to sustain oscillation. Sufficient inductance may be obtained by winding the resistor lead on a 1/8" drill (self-supporting).
The result of these modifications makes the circuit begin to appear as a Collpits oscillator, especially if a small capacitor is added across the 30-ohm resistor.
It is not essential to use both emitter leads. Only when the device is used in a common emitter amplifier does this become necessary.
L1, for optimum unloaded Q, should be made from copper or anything silver plated. The ratio of L1 to the dimension of the cavity is important, (all four sides are needed otherwise a lot of power will be lost). For optimum: Zo = 70-ohms. Inner dimension = 20mm. 0.33 = 6.7mm $\approx$ 0.25"
To scale to 1.3GHz, keep all but the length as for 420MHz. Capacitor C1 will probably need reducing. This may be replaced with a metal disc on a screw.
Using brass for the trough will halve the Q of the tank circuit.

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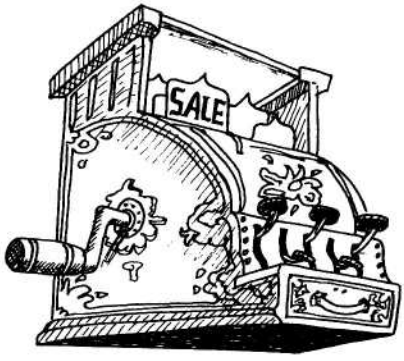

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TO BUY OR BORROW for photocopying, Instruction and service manual for Shibaden SV700ED VTR. Also wanted, set of video heads for SV700ED VTR.
Chris Maxwell G8MKT, Tel: Tamworth (0827) 285949.

TO BUY OR BORROW - the manuals or circuit diagrams or any information whatsoever! on the ITC IKEGAMI CTC-4300 Monochrome Video Camera and the ITC IKEGAMI Monochrome Monitor, model PM900
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BF480	£ 0:70	MC1445	£ 2:90	TBA560	£ 2:10
BFR34A	£ 1:30	MC1496N	£ 0:75	TBA800Q	£ 2:99
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BFR91	£ 1:30	MPS918	£ 0:30	TBA920Q	£ 2:30
BFR96	£ 2:10	NE564N	£ 4:20	TIS88A	£ 0:50
BFW30	£ 1:50	NE592N	£ 1:48	2N2369A	£ 0:36
BFX89	£ 1:29	OM335	£ 7:48	2N3553	£ 3:00
BFY90	£ 0:90	OM361	£ 7:65	2N3819	£ 0:22
BLY33	£ 1:60	PN3568	£ 0:25	2N3866	£ 1:00
BSX20	£ 0:25	SL1621	£ 2:55	2N4427	£ 0:90
J310	£ 0:50	SL1640	£ 2:10	2N5179	£ 0:90
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Mullard Film Trimmers. 1.4 - 5.5pf, 2 - 10pf, 2 - 22pf £ 0:20

Ferrite Beads. FX1115 5p FX1898 12p FX2049 14p

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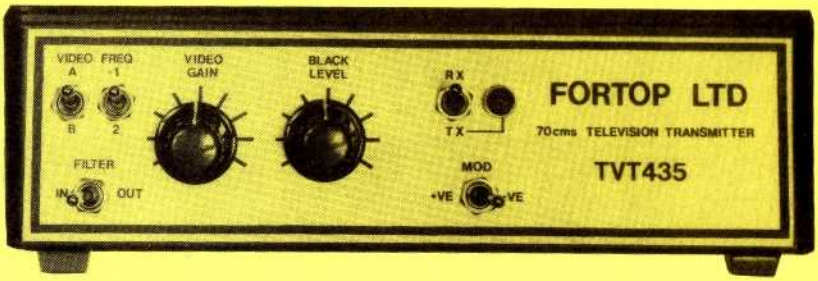
Packing and Postage ..... 50p All prices exclude VAT.



THE TVT 435 TV TRANSMITTER IS BASED ON OUR HIGHLY SUCCESSFUL TVT 432 TV TX UNIT BUT INCORPORATES ADDITIONAL FEATURES FOR THE SERIOUS ATV ENTHUSIAST. SWITCHES CONTROL A CHOICE OF TWO VIDEO INPUTS, TWO VIDEO CARRIER FREQUENCIES, INSERTION OF A VIDEO BANDWIDTH LIMITING FILTER, POSITIVE OR NEGATIVE MODULATION SENSE AND POWER ON-OFF. VIDEO GAIN AND BLACK LEVEL CONTROLS ALLOW PRESICE ADJUSTMENT OF THE TRANSMITTED VIDEO SIGNAL AND OUR SYNC PULSE CLAMP CIRCUIT ENSURES MAXIMUM RF OUTPUT ON THE SYNC PULSE TIPS. THE TVT 435 IS HIGHLY COMPACT AND OFFERS AN EXCEPTIONALLY HIGH STANDARD OF PERFORMANCE AND FACILITIES.

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